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| 10/752,993 | 01/08/2004 | Seisuo Nakajima | 740756-2683 | 6484 |

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| EXAMINER |
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RAO, SHRINIVAS H

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2814

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Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

DETAILED ACTION

Priority

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Applicant's submission filed on November 28, 2006 has been entered and forwarded to the Examiner on December 12, 2006.

Preliminary Amendment

Applicants' amendment filed on June 08, 2006 has been entered and forwarded to the examiner on June 14,

Therefore claims 1-4,8-10,14-16,20-22,26-28 and 32-34 as amended by the amendment and claims 6-7, 12-13,18, 20, 24, 25 ,30-31, and 36 as previously recited are currently pending in the Application.

Claims 5,11,17,23, 29 and 35 have been cancelled by the amendment.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11

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F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993)., In re Longi, 759 F.2d 887,225 USPQ 645 (Fed. Cir. 1985); In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982).,/n re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970),and, In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the continuing application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-36 are rejected under the judicially created doctrine of obviousness- type double patenting as being unpatentable over claim s 1-27 of U.S. Patent No. 6,706,568.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the only difference between the claims of the U.S. Patent No. 6,706,568 and applicants' present invention is that the present invention as claimed omits the step "forming an oxide film on a surface of the above semiconductor film "

However it is noted that claims 1-27 of the 6,706,568 OBVIOUS over claims 1-36 of the instant application. E.g. Claim 1 of 6,706,568 recites all steps of claim 1 of the instant application and Additionally it is an inherent property of the of third laser beam to posses a wavelength different from the first laser beam, because as the claims recite

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the energy density of the third laser is higher than the energy density of the first laser .

Similarly claims 2-36 are also anticipated by claims 1-27 of the 6,706,568 patent.

Applicants' have not provided any Statutory, Fed. Regulatory, MPEP or any other basis on which the double patenting rejection can be held in abeyance and therefore the Examiner cannot hold in abeyance and issue an Office Action, including therein a relief that is not authorized by the Statute, Fed. Reg., MPEP, etc.

Applicants' request to hold in abeyance the double patenting rejection is not persuasive also at least for the reason that Applicants' have not amended any claims and if held in abeyance and because the same claims are rejected twice Applicants' choose to appeal then the double patenting issue may not be considered therefore the abeyance cannot be granted and the double patenting rejection is maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nita et al. (U.S. Patent No. 6,304,329 herein after Nitta, previously applied) and in view of Ouderkrik et al. (U.S. Patent No. 4,879,176 herein after Ouderkrik) (For response to Applicants' arguments see section below).

With respect to claim 1 Nitta describes a method for manufacturing a semiconductor device comprising', forming a semiconductor film over an insulating surface (Nita col. 9

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lines 2-3-SO1. Fig. 1 13 on 11) forming an oxide film on the semiconductor film (Nita col. 9 lines 26-33),

Nita describes radiating the semiconductor film with a first laser beam, but does not specifically mention, the presently newly added limitation of using a lens.

However, Ouderkrik, a patent from the same filed of endeavor (previously applied to some other claims only), describes in col. 17 lines 1-5, etc. radiating the semiconductor film with a first laser beam using a lens to control the exposed area of the sample and thus the energy density of the beam striking the sample.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include Ouderkrik's step of radiating the semiconductor film with a first laser beam using a lens, instead of Nita's unspecified radiating the semiconductor film with a first laser beam in Nita's method, the motivation for the combination is to control the exposed area of the sample and thus the energy density of the beam striking the sample. (Ouderkrik col. 17 lines 1-5).

The remaining Limitations of claim 1 are :

(Nitta col. 12 line 63 # 52) radiating the semiconductor film with a Second laser beam after radiating with the first laser beam; (Nitta col. 12 line 63 # 53) and radiating the semiconductor film with a third laser beam after radiating with the second laser beam, (Nitta col. 12 line 63 # 54) wherein a wavelength of the second laser beam (λ_2) and a wavelength of the third laser beam (λ_3) are different from a wavelength of the first laser beam (λ_1). Col. 12 lines 64-65, $\lambda_1 = 1.55$, $\lambda_2 = 1.4$ and $\lambda_3 = 1.8$).

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B. Claims 2-3,7-9, 13-15, 25-28 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nitta et al. (U.S. Patent No. 6,304,329, herein after Nitta) as applied to claim 1 above and further in view of Mitnaga et al. (U.S. Patent No. 5,808,321, herein after Mitnaga).

With respect to claim 2 Nitta describes the method for manufacturing the semiconductor device according to Claim 1 , wherein a crystallized semiconductor film is formed after radiating the semiconductor film with the first laser beam.

Nitta describes the semiconductor device of claim 1, but does not specifically mention its laser treatment is for the purpose of forming a crystallized semiconductor film.

Mitnaga a patent from the same filed of endeavor, describes in col. 1 lines 20-25, 45-47 etc. describe wherein the radiating the semiconductor film with the first laser beam is held in order to form a crystallized semiconductor film, to crystallize the film at low temperature so as to avoid substrate deformation and reduce the heating time from several ten hours or more necessary for crystallization to about an hour and produce a product having the desired properties.

Therefore it would have obvious to one of ordinary skill in the art at the time of the invention to use Mitnaga's laser annealing in Nitta's method. The motivation for which is to crystallize the film at low temperature so as to avoid substrate deformation and reduce the heating time from several ten hours or more necessary for crystallization to about an hour and produce a product having the desired properties. (Mitnaga col. 2 lines 10-18 ,etc.).

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With respect to claim 3 Nitta describes the method for manufacturing the semiconductor device according to Claim 1, wherein the oxide film on the semiconductor film is removed after radiating the semiconductor film with the second laser beam. (Mitanaga it is a naturally occurring phenomena when annealing by laser (i.e. heating) oxides are chemically reduced and converted to other chemicals i.e. eliminated).

With respect to claim 7 Nitta describes a method for manufacturing a semiconductor device comprising, forming a semiconductor film over an insulating surface; forming an oxide film on the semiconductor film and radiating the semiconductor film with a second laser beam after radiating with the first laser beam under an atmosphere comprising one of hydrogen and an inert gas, (Mitanaga col. 10 lines 30-35) and radiating the semiconductor film with a third laser beam after radiating with the second laser beam, wherein a wavelength of the second laser beam and a wavelength of the third laser beam are different from a wavelength of the first laser beam. (rest of the steps are rejected for reasons stated above under claim 1).

With respect to claim 8 Nitta describes the method for manufacturing the semiconductor device according to Claim 7, wherein a crystallized semiconductor film is formed after radiating the semiconductor film with the first laser beam . (rejected for reasons set out claim 2 above).

With respect to claim 9 Nitta describes the method for manufacturing the semiconductor device according to Claim 7, wherein the oxide film on the

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semiconductor film is removed after radiating the semiconductor film with the second laser beam. (rejected for reasons set out under claim 3 above).

With respect to claim 13 Nitta describes a method for manufacturing a semiconductor device comprising', forming a semiconductor film over an insulating surface forming an oxide film on the semiconductor film ; radiating the semiconductor film with a first laser beam; radiating the semiconductor film with a second laser beam after radiating with the first laser beam; and radiating the semiconductor film with a third laser beam after radiating with the second laser beam under an atmosphere comprising one of hydrogen and an inert gas, wherein a wavelength of the second laser beam and a wavelength of the third laser beam are different from a wavelength of the first laser beam. (rejected for same reasons as set out under claims 1 and 7 above).

With respect to claim 14 Nitta describes the method for manufacturing the semiconductor device according to Claim 13, wherein a crystallized semiconductor film is formed after radiating the semiconductor film with the first laser beam. (rejected for same reasons as set out under claim 2 above).

With respect to claim 15 Nitta describes the method for manufacturing the semiconductor device according to Claim 13, wherein the oxide film on the semiconductor film is removed after radiating the semiconductor film with the second laser beam. (rejected for same reasons as set out under claim 3 above).

With respect to claim 25 Nitta describes a method for manufacturing a semiconductor device comprising, forming a semiconductor film over an insulating surface, forming an oxide film on the semiconductor film ,radiating the semiconductor

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film with a first laser beam; radiating the semiconductor film with a second laser beam after radiating with the first laser beam; and radiating the semiconductor film with a third laser beam after radiating with the second laser beam, wherein an energy of the third laser beam is higher than an energy of the first laser beam, and wherein a wavelength of the second laser beam and a wavelength of the third laser beam are different from a wavelength of the first laser beam. (Nitta example -1 ,col. 5 lines 35-45).

With respect to claim 26 Nitta describes the method for manufacturing the semiconductor device according to Claim 25, wherein a crystallized semiconductor film is formed after radiating the semiconductor film with the first laser beam. (rejected for same reasons as set out under claims 2, 13 above).

With respect to claim 27 Nitta describes the method for manufacturing the semiconductor device according to Claim 25, wherein the oxide film on the semiconductor film is removed after radiating the semiconductor film with the second laser beam. (rejected for same reasons as set out under claim 3 above).

With respect to claim 28 Nitta describes the method for manufacturing the semiconductor device according to Claim 25, wherein the oxide film on the semiconductor film is removed after radiating the semiconductor film with the second laser beam. (rejected for same reasons as set out under claim 3 above).

With respect to claim 31 Nitta describes a method for manufacturing a semiconductor device comprising: forming a semiconductor film over an insulating surface; forming an oxide film on semiconductor film, crystallizing the semiconductor film by a heat treatment to form a crystallized semiconductor film, radiating the

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crystallized semiconductor film with a first laser beam ; radiating the crystallized semiconductor film with a second laser beam after radiating with the first laser beam; and radiating the crystallized radiating with the second laser beam, semiconductor film with a third laser beam after wherein a wavelength of the second laser beam and a wavelength of the third laser beam are different from a wavelength of the first laser beam. (rejected for reason set out under claims 1 ,7, etc. above).

With respect to claim 32 Nitta describes the method for manufacturing the semiconductor device according to Claim 31, wherein a crystallized semiconductor film having improved crystal characteristics is formed after radiating the semiconductor film with the first laser beam. (rejected for reasons set out under claim 20, etc.) .

With respect to claim 33 Nitta describes the method for manufacturing the semiconductor device according to Claim 31, wherein , wherein the oxide film on the semiconductor film is removed after radiating the semiconductor film with the second laser beam. (rejected for same reasons as set out under claim 3 above).

B. Claims 4,6, 10, 12, 16, 18-22,24, 30, 34 & 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nitta et al. (U.S. Patent No. 6,304,329, herein after Nitta) and in view of Mitnaga et al. (U.S. Patent No. 5,808,321, herein after Mitnaga) as applied to claims 2-3,6 et. and further in view of Ouderkrik et al. (U.S. Patent No. 4,879,176 herein after Ouderkrik).

With respect to claim 4, Nitta describes the method for manufacturing the semiconductor device according to Claim 1 , wherein a surface of the semiconductor film is level after radiating the semiconductor film with the second laser beam.

Nitta and Mitnaga do not specifically describe the step of wherein a surface of the semiconductor film is level after radiating the semiconductor film with the second laser beam.

Ouderkrik, a patent from the same field of endeavor describes in Col. 5 lines 38-64 ,etc. the step of wherein the radiating the semiconductor film with the second laser beam is held in order to level a surface of the semiconductor film to form a semiconductor device with reduced optical reflectance, increased optical transmission, increased coating adhesion, a non-yellowed (non-degraded) surface, and a non textured surface.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Ouderkrik's step of wherein a surface of the semiconductor film is level after radiating the semiconductor film with the second laser beam film In Nitta and Mitnaga's method. The motivation to arrive at the above combination is to form a semiconductor device with reduced optical reflectance, increased optical transmission, increased coating adhesion, a non-yellowed (non-degraded) surface, and a non textured surface. (Ouderkrik col.4 lines 54-58, etc.).

With respect to claim 6 Nitta describes the method for manufacturing the semiconductor device according to Claim 1, wherein an energy density of the first laser beam is 300 to 500mJ/cm. (Mitnaga Col. 12 lines 13-15, see also Ouderkrik col. 3 lines 25-30 example 5, etc.).

With respect to claim 10 Nitta describes the method for manufacturing the semiconductor device according to Claim 7, wherein a surface of the semiconductor

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film is level after radiating the semiconductor film with the second laser beam . (rejected for reasons et out under claim 4 above).

With respect to claim 12 Nitta describes the method for manufacturing the semiconductor device according to Claim 7, wherein an energy density of the first laser beam is 300 to 500mJ/cm. (rejected for reasons set out under claim 6 above).

With respect to claim 16 Nitta describes the method for manufacturing the semiconductor device according to Claim 13, wherein a surface of the semiconductor film is level after radiating the semiconductor film with the second laser beam.

It is noted that the functional recitation . (rejected for same reasons as set out under claim 4 above).

With respect to claim 18 Nitta describes the method for manufacturing the semiconductor device according to Claim 13, wherein an energy density of the first laser beam is 300 to 500mJ/cm. (rejected for same reasons as set out under claim 6 above).

With respect to claim 19 Nitta describes a method for manufacturing a semiconductor device comprising forming a semiconductor film over an insulating surface, radiating the semiconductor film with a first laser beam; radiating the semiconductor film with a second laser beam after radiating with first laser beam and radiating the semiconductor film with a third laser beam after radiating with the second laser beam, wherein a pulse width of the second laser beam is smaller than a pulse width of the first laser beam (Ouderkrik example 10) and wherein a wavelength of the second laser beam and a wavelength of the third laser beam are different from a

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wavelength of the first laser beam. (rest of the limitations rejected for reasons set out under claims 1 ,7 etc.).

With respect to claim 20 Nitta describes the method for manufacturing the semiconductor device according to Claim 19, wherein a crystallized semiconductor film is formed after radiating the semiconductor film with the first laser beam . (rejected for reasons set out under claim 2 above).

With respect to claim 21 Nitta describes the method for manufacturing the semiconductor device according to Claim 19, wherein the oxide film on the semiconductor film is removed after radiating the semiconductor film with a second laser beam. (rejected for reasons set out under claim 3 above).

With respect to claim 22 Nitta describes the method for manufacturing the semiconductor device according to Claim 19, wherein wherein a surface of the semiconductor film is level after radiating the semiconductor film with the second laser beam.

With respect to claim 24 Nitta describes the method for manufacturing the semiconductor device according to Claim 19, wherein an energy density of the first laser beam is 300 to 500mJ/cm. (rejected for reasons set out under claim 6 above).

With respect to claim 29 Nitta describes the method for manufacturing the semiconductor device according to Claim 25, wherein the method further comprises a step of forming an oxide film on the semiconductor film before radiating the semiconductor film with the first laser beam. (rejected for reason set out under claim 5 above).

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With respect to claim 30 describes the method for manufacturing the semiconductor device according to Claim 25, wherein an energy density of the first laser beam is 300 to 500mJ/cm .(rejected for reason set out under claim 6 above).

With respect to claim 34 Nitta describes the method for manufacturing the semiconductor device according to Claim 31, wherein a surface of the semiconductor film is level after radiating the semiconductor film with the second laser beam. (claim 4)

With respect to claim 36 Nitta describes the method for manufacturing the semiconductor device according to Claim 31, wherein an energy density of the first laser beam is 300 to 500mJ/cm. (claim 6).

Response to Arguments

Applicant's arguments filed on November 28, 2006 have been fully considered but they are not persuasive for the following reasons :

Applicants' first contention that the Obviousness type double patenting rejection under the judicially created doctrine is traversed because allegedly the claims of the "568 patent do not recite" a wave length of the second laser beam and a wave length of the third laser beam are different from a wave length the (sic.) first laser beam" is not persuasive because it is an inherent property of the of third laser beam to possess a wavelength different from the first laser beam, because as the claims recite the energy density of the third laser is higher than the energy density of the first laser .

Applicants' contend that the Examiner 's statement that different wavelength of the lasers is unsupportable.

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For the record it is noted that Applicants' specification page 6 lines 2-3 states that the first energy density of (the first laser is) $300\text{-}500\text{ mJ/cm}^2$ (results) produces a first laser having a first wavelength.

Applicants' specification page 16 lines 10-15 states that the second energy density lower than $300\text{-}500\text{ mJ/cm}^2$ of the second laser (results) produces a second laser having a first wavelength.

Applicants' specification page 5, 8 lines 25-30 states that that the energy density of the third laser is $30\text{-}60\text{ mJ/cm}^2$ higher than the first i.e. $330\text{ to }530\text{ mJ/cm}^2$ or energy density of $360\text{ to }560\text{ mJ/cm}^2$ (results) produces a third laser of having a different third wavelength different from the first and second wave lengths .

Therefore a complete reading of Applicants' own specification provides sufficient explanation as to why the inherency (namely an inherent property of the of third laser beam to posses a wavelength different from the first laser beam, because as the claims recite the energy density of the third laser is higher than the energy density of the first laser) would necessarily exist or flow from the prior art.

Similarly claims 2-36 are also anticipated by claims 1-27 of the 6,706,568 patent.

Applicants' third contention to hold the double patenting rejection in abeyance is also not persuasive for the following reasons.

Applicants' have not provided any Statutory, Fed. Regulatory, MPEP or any other basis on which the double patenting rejection can be held in abeyance and therefore the Examiner cannot hold in abeyance and issue an Office Action, including therein a relief that is not authorized by the Statute, Fed. Reg., MPEP, etc.

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Applicants' request to hold in abeyance the double patenting rejection is not persuasive also at least for the reason that Applicants' Have not amended any claims and if held in abeyance and because the same claims are rejected twice Applicants' choose to appeal then the double patenting issue may not be considered therefore the abeyance cannot be granted and the double patenting rejection is made Final.

Applicants' contention that claim1 as amended is not rendered obvious by Nita is moot in view of the obviousness rejection herein above.

Therefore Applicants' this contention is also not persuasive.

Applicants' next contention that the applied Nitta reference does not disclose radiating the semiconductor film with laser beams because Nitta's elements' 52,53 and 54 are laser diodes provided in order to detect angular velocity of the other object.. " is also not persuasive because Applicants'/attorneys' have not considered the teachings at col. 8 lines 5 to 12 of Nitta which describe that (prior art to Nita) methods of using semiconductor laser for growing crystals by radiating laser beam on the semiconductor to crystallize the crystal is the same as Applicant's description in their specification.

Further Applicants have not understood the cited portion wherein in alternative embodiments the elements 52,53 and 54 also include single/multiple quantum wells (col. 8 lines 54-57) and further description in an embodiment in col. 6 lines describes treatment where in laser is incident upon the semiconductor layer.

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Further proof of laser beam being projected is col. 9 lines 26-34 which describe insulating films are formed in side surface to contain light (laser) from exiting and provide total internal reflection and prevent the semiconductor laser from deteriorating.

Therefore all the presently recites steps in claim 1 are taught by Nita.

Applicants' contention that the 103 rejection of claims 2,3,7-9,11,13-15,17,25-28 and 31-33 and claims 7,13,19,25 and 31 were alleged to be allowable for the same reasons set out under claim 1 above.

However as seen above the reasons under claim 1 are not persuasive, therefore Applicants' arguments with respect to claims 2,3,7-9,11,13-15,17,25-28 and 31-33 and claims 7,13,19,25 and 31 which essentially repeat the same arguments as above are also not persuasive .

Similarly the arguments for claims 4,6,10,12,16,18-24, 29-30 and 34-36 essentially repeat the same arguments as above and also are not persuasive.

Therefore considering the proper combination of the applied references along with proper motivation/suggestion and reasonable expectation of success has been established beyond a shadow of doubt and if Applicants' dispute this they must provide concrete evidence and not mere conclusionary statements without any support.

Applicants' are reminded that 37 CFR Section 1.111 (b) states, "A general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes tem from the references does not comply with the requirements of this section".

Applicant has failed to specifically point out how the language of the claims

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patentably distinguishes them from the references.

Therefore all of Applicants' arguments are not persuasive or insufficient because of their failure to specifically point out how the language of the claims patentably distinguishes them from the references.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. Rao whose telephone number is (571)272-1718. The examiner can normally be reached on 8.00 to 5.00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fahmy Wael can be reached on (571) 272-1714. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

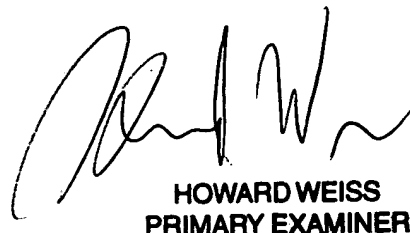
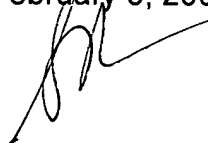
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Steven H. Rao

Patent Examiner.

February 8, 2007.



HOWARD WEISS
PRIMARY EXAMINER